



R.M.K. ENGINEERING COLLEGE

(An Autonomous Institution)

R.S.M Nagar, Kavaraipettai, Gummidipoondi Taluk, Thiruvallur District, Tamil Nadu- 601206

Affiliated to Anna University, Chennai / Approved by AICTE, New Delhi/Accredited by NAAC with A+ Grade
An ISO 21001:2018 Certified Institution / All the Eligible UG Programs are accredited by NBA, New Delhi



Department of Computer Science and Design

Course Outcomes

ODD Semester 2024-25

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1	3	Theory	Discrete Mathematics
2	3	Theory	Universal HumanValues 2: Understanding Harmony
3	3	Theory	Computer Organization and Architecture
4	3	Theory with Practical	Advanced Java Programming
5	3	Theory with Practical	Operating Systems
6	3	Theory with Practical	Design Thinking
7	3	Practical	Product Development Lab – 3
8	3	Practical	Aptitude and Coding Skills I
9	3	Practical	Internship and Seminar*
10	3	-	Value Education (Non Credit)
Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1	5	Theory	Open Elective I
2	5	Theory	Professional Elective II
3	5	Theory	Professional Elective III
4	5	Theory	Computer Graphics and Multimedia
5	5	Theory with Practical	Product Centric Agile Development

6	5	Theory with Practical	Computer Networks
7	5	Theory with Practical	Advanced Aptitude and Coding Skills I
8	5	Practical	Internship*
9	5	-	Indian Constitution (Non Credit)
Sl. No.	Semester	Theory/ Practical/Honour Degree/Minor Degree	Course Code / Course Name
1	7	Theory with practical	20CD701- Cloud Computing (Lab Integrated)
2.	7	Theory	20CE002- Geographic Information System
3.	7	Theory with practical	20CD915- Web Development Frameworks (Lab Integrated)
4.	7	Theory with practical	20CD913- Game Design(Lab Integrated)
5.	7	Practical	20IT928- Professional Readiness For Innovation, Employability And Entrepreneurship
6.	7	Minor Degree	20EC960 -Robot Operating System

EVEN Semester 2024-25

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1	4	Theory	Probability and Statistics
2	4	Theory with Practical	Web Development Frameworks
3	4	Theory	Design and analysis of algorithms
4	4	Theory	Human Computer Interaction
5	4	Theory with Practical	Design Programming
6	4	Theory with Practical	Professional Elective I
7	4	Practical	Advanced Aptitude and Coding Skills II
8	4	Practical	Product Development Lab - 4
9	4	Practical	Aptitude and Coding Skills II
10	4	-	Yoga/ Personality Development (Non Credit)

Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1	6	Theory	Professional Ethics
2	6	Theory	Open Elective II
3	6	Theory with Practical	Object Oriented Software Engineering
4	6	Theory with Practical	Principles of UI/UX Design
5	6	Theory with Practical	Professional Elective IV
6	6	Theory with Practical	Professional Elective V
7	6	Practical	Advanced Aptitude and Coding Skills II
Sl. No.	Semester	Theory/ Practical	Course Code / Course Name
1	8	Practical	Project Work

ODD Semester 2024-25

3rd Semester – B.E. Computer Science and Design

22MA301-Discrete Mathematics

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Examine the validity of the arguments

CO2: Apply various proof techniques and principles using analytic and combinatorial methods

CO3: Develop the recurrence relation for the given problems.

CO4: Implement graph theory technique to solve real time problems.

CO5: Understand groups, Rings and Fields.

22CS304- Operating Systems

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Describe computer system organization, operating system structures, and

CO6: Solve problems in lattices and Boolean algebra.

22GE301- Universal HumanValues 2: Understanding Harmony

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Be aware of themselves, and their surroundings (family, society, nature).

CO2: Be more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

CO3: Have better critical ability.

CO4: Become sensitive to their commitment towards what they have understood (human values, human relationships, and human society).

CO5: Be able to apply what they have learnt to their own self in different day- to-day settings in real life, at least a beginning would be made in this direction.

22CS302- Computer Organization and Architecture

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Explain the basic principles and operations of digital computers.

CO2: Design Arithmetic and Logic Unit to perform fixed and floating-point operations

CO3: Analyze and Implement Instruction Execution.

CO4: Evaluate Pipelining and Superscalar Operations..

CO5: Understand I/O and Memory Systems.

CO6: Explore Parallel Processing and Multicore Computers.

22CS305- Advanced Java Programming

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Implement various data structures by utilizing core Java features and libraries.

CO2: Demonstrate proficiency in handling Java I/O operations, including file manipulation for efficient data storage and retrieval..

CO3: Apply and Analyze the Stream API for functional programming and data processing.

CO4: Implement advanced object serialization for complex data structures.

CO5: Utilize regular expressions for text parsing and string manipulation..

CO6: Build applications using advanced Java programming techniques.
services.

CO2: Demonstrate basic Unix commands and develop programs using shell scripting.

CO3: Analyze process concepts and scheduling, and implement interprocess communication using message queues.

CO4: Implement CPU scheduling algorithms and use threading models to manage concurrency.

CO5: Address process synchronization issues and implement deadlock avoidance techniques.

CO6: Understand and Apply Memory and Storage Management Techniques.

22CD301- Design Thinking

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Understand the phases of design thinking process.

CO2: Conduct an immersion activity to create an empathy map.

CO3: Define the key problems of the personas created.

CO4: Apply the ideation phase steps to present the prototype ideas.

CO5: Create a prototype with value propositions and test the prototype

Laboratory

22ME311- PRODUCT DEVELOPMENT LAB – 3

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1 : Enhance their skills in design concepts, rules and procedures.

CO2 : Develop their cognitive strategy to think, organize, learn and behave.

CO3 : Demonstrate the ability to provide conceptual design strategies for a product.

CO4 : Describe the procedure for designing a Mock-up model.

CO5 : Recognize and apply appropriate interdisciplinary and integrative strategies for solving complex problems.

22CS311 - APTITUDE AND CODING SKILLS – I

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Develop vocabulary for effective communication and reading skills.

CO2: Build the logical reasoning and quantitative skills.

CO3: Develop error correction and debugging skills in programming.

ODD Semester 2024-25

5th Semester – B.E. Computer Science and Design

OPEN ELECTIVE-I

22EC012-INDUSTRIAL IOT APPLICATIONS

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Describe IOT, IIOT.

CO2: Understand various IoT Layers and their relative importance

CO3: Interpret the requirements of IIOT sensors and understand the role of actuators.

CO4: Study various IoT platforms and Security

CO5: Realize the importance of Data Analytics in IoT..

CO6: Design various applications using IIoT in manufacturing sector

22CD919- GAME DESIGN

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Use the Fundamental principles of Game Design and Development in context.

CO2: Able to apply AI techniques in Game Design and Development.

CO3: Thoroughly understand the detailed processes of the Game Engine.

CO4: Design and Implement simple 2D games using the design and development process learnt.

CO5: Design and Implement simple 3D games using the design and development process learnt.

22AI301- ARTIFICIAL INTELLIGENCE

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Illustrate the structure of agents and to implement various Intelligent agents

CO2: Apply search strategies in problem solving and game playing using heuristic function.

CO3: Implement logical agents and first-order logic problems.

CO4: Apply problem-solving strategies with knowledge representation mechanism for solving hard problems..

CO5: Demonstrate the basics of expert systems and to develop models using machine learning techniques.

22CD501- COMPUTER GRAPHICS AND MULTIMEDIA

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Implement 2D transformations and algorithms for generating primitives and attributes.

CO2: Solve problems in 3D transformations and viewing.

CO3: Implement the process of open source Vulkan API.

CO4: Implement rendering techniques and use advanced based rendering.

CO5: Apply lighting and shading models to enhance graphical scenes.

CO6: Understand the multimedia systems and animation.

22CD502- PRODUCT CENTRIC AGILE DEVELOPMENT

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Apply agile development methods in software development practices.

CO2: Obtain knowledge on Product Centric Value Delivery.

CO3: Implement Agile metrics and its ways of working.

CO4: Apply Product Centric Agile Development to develop web services

CO5: Apply DevOps concepts and tools for Web Development.

CO6: Develop effective collaboration and communication skills essential for working
Within agile teams

22CS501- COMPUTER NETWORKS

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Understand the fundamental concepts of computer networks.

CO2: Apply the various routing protocols to solve real-world problems.

CO3: Build simple applications to solve societal problems..

CO4: Apply the simulation tools to implement various protocols used in the various layers.

CO5: Analyze the various application layer protocols.

CO6: Apply the mathematical knowledge to do performance analysis of various routing

22CS511 - ADVANCED APTITUDE AND CODING SKILLS - I

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Develop vocabulary for effective communication and reading skills.

CO2: Build the logical reasoning and quantitative skills.

CO3: Develop error correction and debugging skills in programming.

Laboratory

INDIAN CONSTITUTION

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Interpret the knowledge on Indian Constitution.

CO2: Demonstrate the knowledge gained through fundamental rights concept.

CO3: Relate the concept of Lok Sabha and Rajya Sabha.

CO4: Illustrate the concept of Legislative Assembly and Legislative Council.

CO5: Analyze the concept of Local Self Government.

ODD Semester 2024-25

7th Semester – B.E. Computer Science and Design

20CD701- CLOUD COMPUTING (LAB INTEGRATED)

COs	Course Outcome : The students, after the completion of the course, are expected to....
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CO1	Understand the basic concepts and key technologies of cloud computing
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CO2	Apply the virtualization techniques for the development of cloud.
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CO3	Understand and use the architecture of compute and storage cloud, service and delivery models.
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CO4	Identify the core issues of cloud computing such as resource management and Security
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CO5	Analyze the various cloud service providers and other emerging cloud-based tools.
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20CE002- GEOGRAPHIC INFORMATION SYSTEM

COs	Course Outcome : The students, after the completion of the course, are expected to....
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CO1	Describe the fundamentals of maps and their characteristics, GIS & its components.
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CO2	Demonstrate various spatial data models and their advantages
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CO3	Identify GIS Data sources, data input, data editing and conversion.
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CO4	Carryout raster and vector data analysis for various applications.
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CO5	Explain the spatial information along with quality assessment for applications.
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CO6	Identify an error free GIS database for civil engineering applications.
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20CD915 WEB DEVELOPMENT FRAMEWORKS (LAB INTEGRATED)

COs	Course Outcome : The students, after the completion of the course, are expected to....
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CO1 Personalize web pages using text formatting, graphics, audio, and video.

CO2 Hands on knowledge on Rest API, propTypes

CO3 Able to develop a web application using latest React Framework

CO4 Apply various React features including functions, components, and services.

CO5 Able to develop application using ReactJs hooks.

20CD913 - GAME DESIGN (LAB INTEGRATED)

COs **Course Outcome : The students, after the completion of the course, are expected to....**

CO1 Use the Fundamental principles of Game Design and Development in context

CO2 Able to apply AI techniques in Game Design and Development ·

CO3 Thoroughly understand the detailed processes of the Game Engine ·

CO4 Design and Implement simple 2D games using the design and development process
Learnt

CO5 Design and Implement simple 3D games using the design and development
process learnt.

Laboratory

20IT928- PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

COs **Course Outcome : The students, after the completion of the course, are expected to....**

CO1 Upskill in emerging technologies and apply to real industry-level use cases

CO2 Understand agile development process

CO3 Develop career readiness competencies, Team Skills / Leadership qualities

CO4 Develop Time management, Project management skills and Communication Skills

CO5 Use Critical Thinking for Innovative Problem Solving

CO6 Develop entrepreneurship skills to independently work on products

Minor Degree in Internet of Things

20EC960-ROBOT OPERATING SYSTEM	
COs	Course Outcome : The students, after the completion of the course, are expected to....
CO1 Understand the robotics design and implementation	
CO2 Comprehend, classify and analyze the behavior of different types of sensors and actuators.	
CO3 Understand the ROS fundamentals	
CO4 Gain the knowledge about the types of actuators: electrical, pneumatic, and hydraulic, performance criteria and selection.	
CO5 Design robotic applications using ROS.	
CO6 Design Robots with Localization.	

EVEN Semester 2024-25

4th Semester – B.E. Computer Science and Design

22MA401- PROBABILITY AND STATISTICS	
Cos	Course Outcome: Upon completion of the course, the students will be able to:
CO1: Calculate the statistical measures of standard distributions.	
CO2: Compute the correlation & regression for two dimensional random variables	
CO3: Apply the concept of testing the hypothesis.	
CO4: Implement the concept of analysis of variance for various experimental designs.	
CO5: Demonstrate the control charts for variables and attributes	
22IT403- WEB DEVELOPMENT FRAMEWORKS	
Cos	Course Outcome: Upon completion of the course, the students will be able to:
CO1: Personalize web pages using text formatting, graphics, audio, and video.	
CO2 : Hands on knowledge on Rest API , propTypes.	
CO3: Able to develop a web application using latest React Framework.	
CO4 : Apply various React features including functions, components, and services.	
CO5 : Able to develop application using ReactJshooks.	
22CS306- Design and analysis of algorithms	
Cos	Course Outcome: Upon completion of the course, the students will be able to:
CO1: Evaluate the efficiency of algorithms using asymptotic notations.	

CO2: Design, implement, and analyze the time complexity of various sorting algorithms
CO3: Develop solutions for optimization problems using dynamic programming techniques.
CO4: Implement and analyze greedy algorithms for optimization problems
CO5: Develop solutions for complex problems using backtracking and branch and bound techniques.
CO6: Analyze NP-complete problems and implement approximation algorithms for these problems

22CD401- Human Computer Interaction

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Enumerate the basic concepts of human, computer interactions.
CO2: Inspect software design process in human computer interaction
CO3: Examine various models and theories related to human computer interaction
CO4: Build meaningful user interface
CO5: Establish the different levels of communication across the application stakeholders.

22CD402- Design Programming

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Learn about Blender interface.
CO2: Understand Texture Mapping and Rendering.
CO3: Analyse Text to Mesh Object and Curve conversion.
CO4: Know the scripting fundamentals.
CO5: Understand accessing game objects.

Laboratory

CO 3: Evaluate the methods to develop solutions to the problem.
CO 4: Analyze the business opportunities for a new product.
CO 5: Prepare a detailed report for the experimental dissemination.

22CS411- APTITUDE AND CODING SKILLS – II

22ME411- Product Development Lab - 4

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO 1: Identify the real-time problems through literature.
CO 2: Develop feasible solutions for the problems.

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Develop advanced vocabulary for effective communication and reading skills.

CO2: Build an enhanced level of logical reasoning and quantitative skills.

CO3: Develop error correction and debugging skills in programming.

CO4: Apply data structures and algorithms in problem solving.

22CS412- MINI PROJECTAND DESIGN THINKING LAB

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Understand the design thinking process and able to visualize the problem

CO2: Analyse the problem using innovation tools

CO3: Design a prototype for an identified problem solution.

CO4: Testing and evaluate strategies in improving the solution.

CO5:Apply the innovation ideas to real-world applications.

EVEN Semester 2024-25

6th Semester – B.E. Computer Science and Design

22CE701- PROFESSIONAL ETHICS IN ENGINEERING

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Summarize the importance of human values in work place.

CO2: Discuss the senses of engineering ethics, moral dilemmas, moral autonomy and uses of ethical theories.

CO3: Describe the role of engineers as responsible experimenters and necessity of codes of ethics in engineering.

CO4: Explain safety, risk, responsibilities and rights in the society.

CO5: Analyze the global issues related to environmental ethics, computer ethics, weapons development and the role of engineers as expert witnesses and advisors.

CO6: Apply ethics in society and discuss the ethical issues related to engineering.

22AI005- INTRODUCTION TO GENERATIVE AI

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Elaborate the basic concepts of generative AI

CO2: Build generative AI to generate images.

22CS602- OBJECT ORIENTED SOFTWARE ENGINEERING

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Analyze and gather software requirements.

CO2: Use UML to create static and dynamic models.

CO3: Design software components using object-oriented principles.

CO4: Apply various software testing strategies.

CO5: Apply various software testing strategies.

22CD601- PRINCIPLES OF UI/UX DESIGN

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Understand the principles of User Interface (UI) Design in order to design with intention.

CO2: Learn the effective User eXperience (UX) and the psychology behind user decision making

CO3: Understand the importance of UX process and user Psychology

CO4: Elucidate the implications for designing web application with multimedia effects.

CO5: Create Wireframe and Prototype.

CO6: Develop the ability to work collaboratively within design teams and articulate design ideas and decisions effectively.

22CS611- ADVANCED APTITUDE AND CODING SKILLS – II

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Develop advanced vocabulary for effective communication and reading skills.

CO2: Build an enhanced level of logical reasoning and quantitative skills.

CO3: Develop error correction and debugging skills in programming.

CO4: Apply data structures and algorithms in problem solving.

CO3: Apply the concepts used in generative AI models.

CO4: Use various generative AI models.

CO5: Compare and use the various large language models.

CO6: Analyse the basics of prompt engineering.

22CD934 - C# AND .NET PROGRAMMING

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Implement Class and Object concepts using C# Language in the .NET Framework.

CO2: Develop distributed applications using .NET Framework.

CO3: Develop application using advanced C# features.

CO4: Understand window-based application, WCF and WWF

CO5: Learn assembly management, XAML handling and error resolution.

CO6: Create mobile applications using .NET compact Framework.

22CS903- BLOCK CHAIN TECHNOLOGY

Cos Course Outcome: Upon completion of the course, the students will be able to:

CO1: Understand the technology components of Blockchain and how it works behind the scenes.

CO2: Understand the Bitcoin and its limitations by comparing with other alternative coins.

CO3: Develop deep understanding of the Ethereum model, its consensus model, code execution.

CO4: Understand the architectural components of a Hyperledger and its development framework.

CO5: Explore the alternative blockchains and its emerging trends.

CO6 : Understand blockchain technology, including Bitcoin, Ethereum, and alternative blockchains